THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 38

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte CRAIG W. ADAMS

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Appeal No. 1997-1668
Application No. 08/361,024[1]

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ON BRIEF

_____

Before WILLIAM F. SMITH, SPIEGEL, and SCHEINER, Administrative Patent Judges.

SPIEGEL, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-7, which are all of the claims pending in this application.

Claims 1 and 5 are illustrative and read as follows.

[1] Application for patent filed December 21, 1994. According to appellant, this application is a continuation of application no. 07/925,059 filed August 4, 1992, now abandoned.

1. A kit comprising reagents for amplification of at least one target sequence comprising at least one region having a defined nucleic acid sequence, the kit comprising at least one Blocker moiety, at least one Primer moiety, and at least one End-Run moiety, where the Blocker moiety is capable of hybridizing to the nucleic acid sequence, the Primer moiety is capable of hybridizing to the nucleic acid sequence such that the Primer moiety abuts the hybridized Blocker moiety or is capable of extending to the hybridized Blocker moiety, and the End-Run moiety comprises a sequence which is complementary to at least a portion of the Blocker moiety. [Emphasis added.]

5. A kit comprising components for conducting a reaction for amplifying or detecting a target sequence of a polynucleotide, said reaction comprising the steps:

a) treating said polynucleotide with at least three oligonucleotide moieties wherein said at least three oligonucleotide moieties include:

i) a first oligonucleotide moiety comprising a nucleotide sequence complementary to and capable of hybridizing to the polynucleotide;

ii) a second oligonucleotide moiety complementary to and capable of hybridizing to the polynucleotide such that the second oligonucleotide moiety abuts the first oligonucleotide moiety when the first oligonucleotide moiety is hybridized to the polynucleotide or such that the second oligonucleotide is capable of extending to the first oligonucleotide moiety when the first oligonucleotide moiety is hybridized to the polynucleotide; and

iii) a third oligonucleotide moiety comprising a sequence which is complementary to at least a portion of the first oligonucleotide moiety;

b) providing conditions for hybridizing the first moiety and the second moiety to the polynucleotide;

c) providing conditions for ligating the hybridized first moiety to the hybridized second moiety to form a ligation product; and

d) providing conditions for hybridizing and chain extending the third moiety,

said components being capable of buffering said reaction to a pH of 6 - 9 and capable of promoting ligase and polymerase specificity and processivity. [Emphasis added.]

The references relied on by the examiner are:

Mullis et al. (Mullis)	4,683,195	Jul. 28, 1987
Landegren et al. (Landegren)	4,988,617	Jan. 29, 1991

Claims 1-7 stand rejected under 35 U.S.C. § 103 as being unpatentable over Landegren in view of Mullis. We REVERSE.

In reaching our decision in this appeal we have given careful consideration to the appellant's specification and claims and to the respective positions articulated by the appellant and the examiner. We make reference to the examiner's answer (Paper No. 37, mailed July 23, 1996) for the examiner's reasoning in support of the rejection and to the appellant's brief (Paper No. 36, filed April 22, 1996) for the appellant's arguments thereagainst.

OPINION

To establish a prima facie case of obviousness, there must be both some suggestion or motivation to modify the reference or combine reference teachings and a reasonable expectation of success. Furthermore, the prior art must teach or suggest all the claim limitations. In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991).

Landegren describes an assay for determining the nucleic acid sequence in a region of a nucleic acid test substance having a known normal sequence and a known possible mutation at a target nucleotide position involving use of two probes (i.e., primers), i.e., a target probe and an adjacent probe, capable of hybridizing to immediately adjacent parts of a complementary test substance. The target probe has an end region nucleotide which is complementary to the normal or mutation nucleotide at the corresponding target nucleotide position. When the target probe and the adjacent probe hybridize to one strand of the nucleic acid test substance in the presence of a linking agent, e.g., a ligase, the target probe and the adjacent probe will link (i.e., ligate) only if the target nucleotide is correctly base paired with the target probe. Determining the presence or absence of ligation indicates whether the target nucleotide is normal or a mutation. See col. 2, line 34 - col. 3, line 20. Landegren discloses a kit comprising a target probe, an adjacent probe and a ligase (col. 3, lines 39-52).

Mullis describes a process known as the polymerase chain reaction (PCR) comprising treating separated complementary strands of a nucleic acid with a molar excess of two oligonucleotide primers, selected such that each primer hybridizes to the 3' terminus of a different strand of the double-stranded molecule, and extending the hybridized primers by a polymerase. The duplexes formed by the extension are then separated and each newly formed nucleic acid sequence becomes the template of the

other primer for another polymerase extension reaction. Each time the process is repeated the amount of newly formed nucleic acid sequences doubles. See col. 2, line 46 - col. 3, line 33. Mullis discloses adding a labeled probe capable of hybridizing to the sequence being detected/amplified or a mutation thereof (col. 3, lines 25-27) and a kit comprising the two oligonucleotide primer (col. 3, lines 34-55).

According to the examiner,

> [i]t would have been obvious to add a third oligonucleotide into the kit [of Landegren] for the detection of the ligated product of the first and second oligonucleotides, as Mullis et al. discloses detecting a nucleic acid product by using a probe having a sequence complementary to the target nucleic acid to be detected (col. 3, lines 3-33; in particular, lines 25-27) (answer, page 4).

The flaw in the examiner's analysis is that the ligated product is not the same as the first Blocker oligonucleotide. Thus, the "detection" probe might have a sequence complementary to the second Primer oligonucleotide moiety of the ligated product. However, all of the claims on appeal require the third End-Run oligonucleotide to comprises a sequence which is complementary to at least a portion of the first Blocker oligonucleotide. The examiner has not pointed out, and we do not find, where either Landegren or Mullis disclose or suggest this limitation, i.e., that the End-Run oligonucleotide be complementary to at least a portion of the Blocker oligonucleotide. The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggests the desirability of the modification. That is not the

case here. Accordingly, we conclude that the examiner has not established a prima facie case of obviousness.

The rejection of claims 1-7 over Landegren in view of Mullis is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-7 under 35 U.S.C. § 103 as being unpatentable over Landegren in view of Mullis is reversed.

REVERSED

WILLIAM F. SMITH Administrative Patent Judge	)
CAROL A. SPIEGEL Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
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